Rural Research and Development for Profit Programme

Smarter Irrigation for Profit

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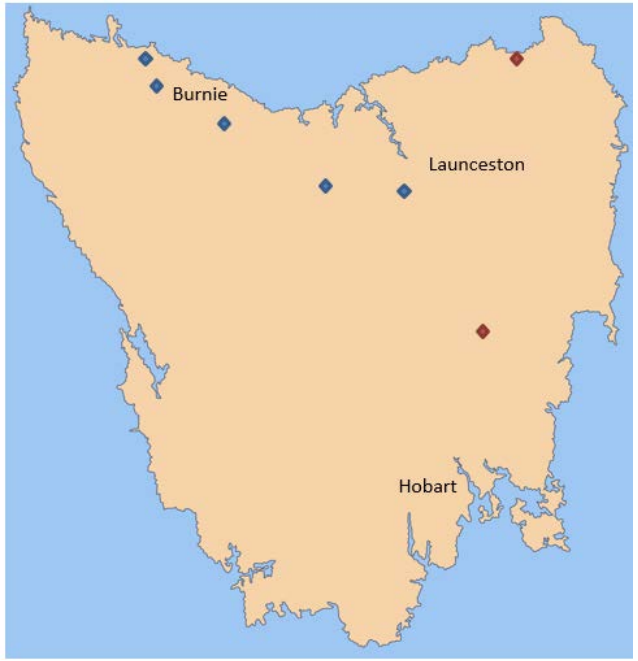
TIA is a joint venture of the University of Tasmania and the Tasmanian Government

Project overview

- Partnership between irrigation industries of Cotton, Dairy, Rice and Sugar
- Ten key activities across 4 industries with 16 R&D partners and 19 farmer managed learning sites across 5 states
- Three key components
  - Irrigation scheduling technologies
  - Smart automated irrigation
  - A network of farmer managed learning sites (Optimised irrigation farms)

Project 2b – Smart Automated irrigation

- Increasing farm profit through efficient use of irrigation input to dairy pastures
  - Five Farmer sites
    - 4 with human interface
    - 1 with Automation (VARIwise)



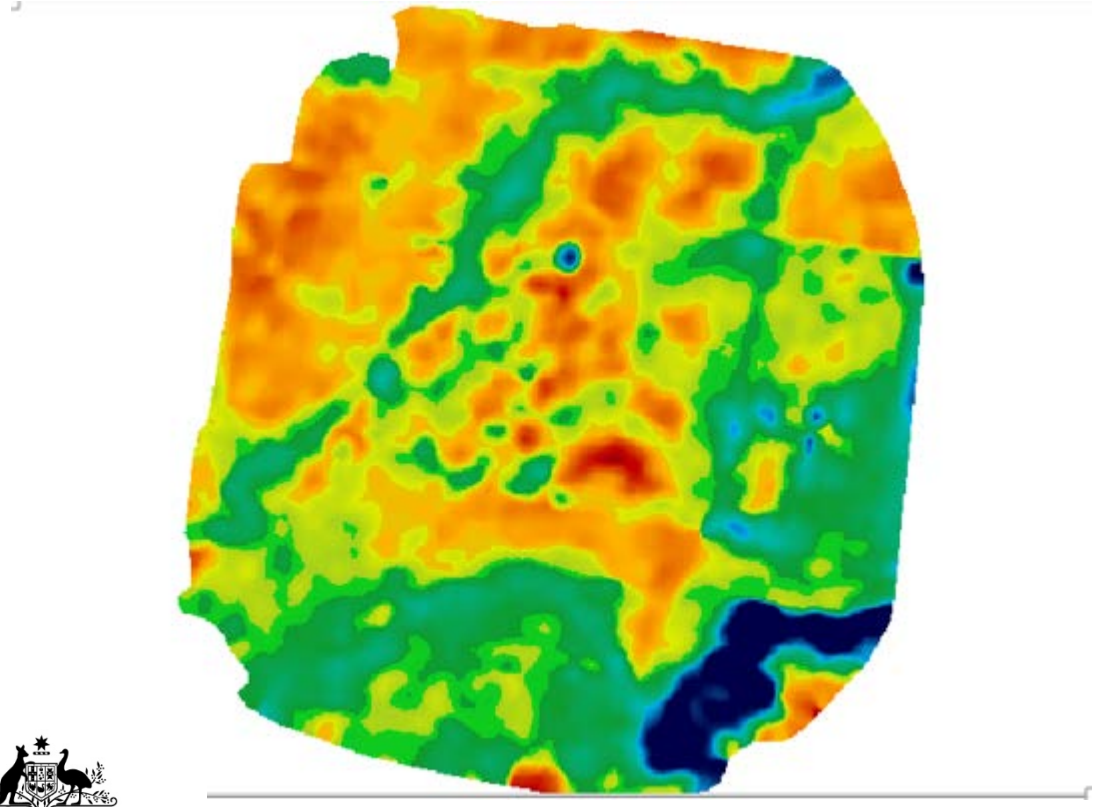
Key learnings for 2015/16

- Measures of variability
- Energy Use
- Pasture Productivity
- Automation

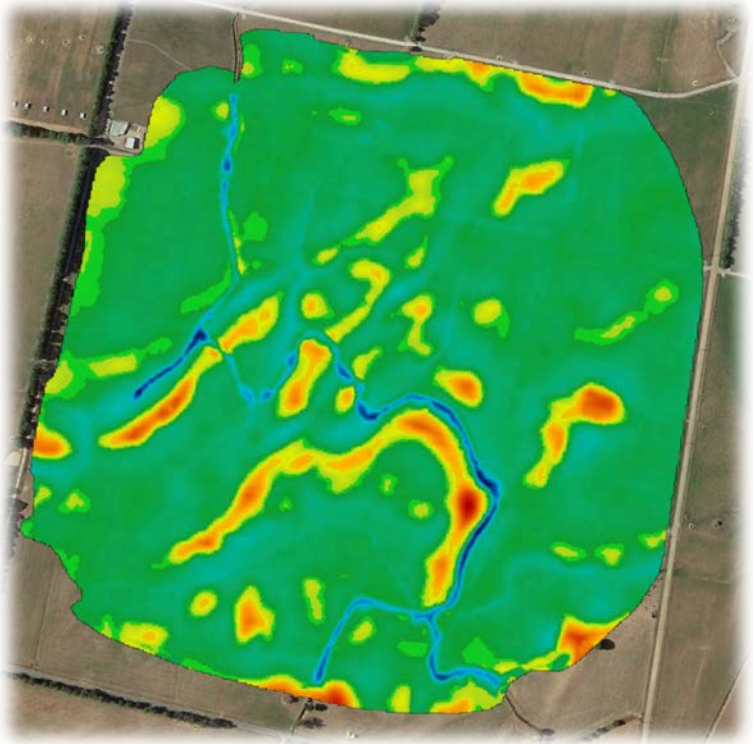
Variability - Montana site

Variability maps

EM 38



Landscape Change



Dairy Australia
Your Levy at Work

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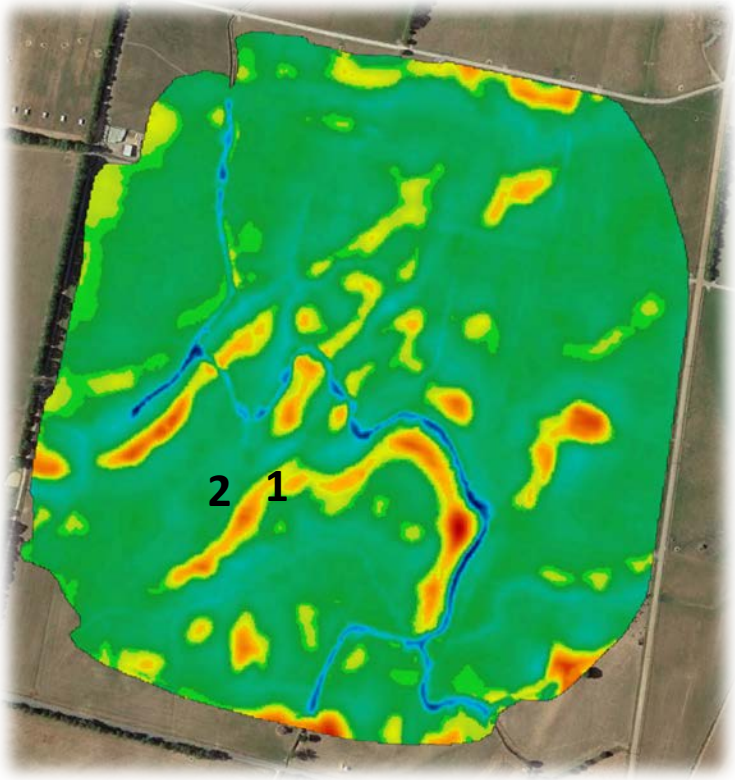
Landscape Change



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Energy Use

Energy use in pumping

Pivot Site	Flow m3/hr	Pump Size	Motor size (kW)	kWhr/ML	$/kWhr	$/ML
1	232	150x125-315	30	113	0.23	$26.08
2	225	150x125-315	37	157	0.23	$36.16
3	316	150x125-250	75	220	0.23	$50.65
4	163	100x75-315	45	304	0.23	$70.00
5	**92**	**100x65-315**	**75**	**787**	**0.23**	**$181.05**

- Benchmarks
  - 4-8 kWh/ML/meter head
  - 150-300 kWh/ML
  - $30-70/ML Daley and Callow 2014

Energy savings

Site 5

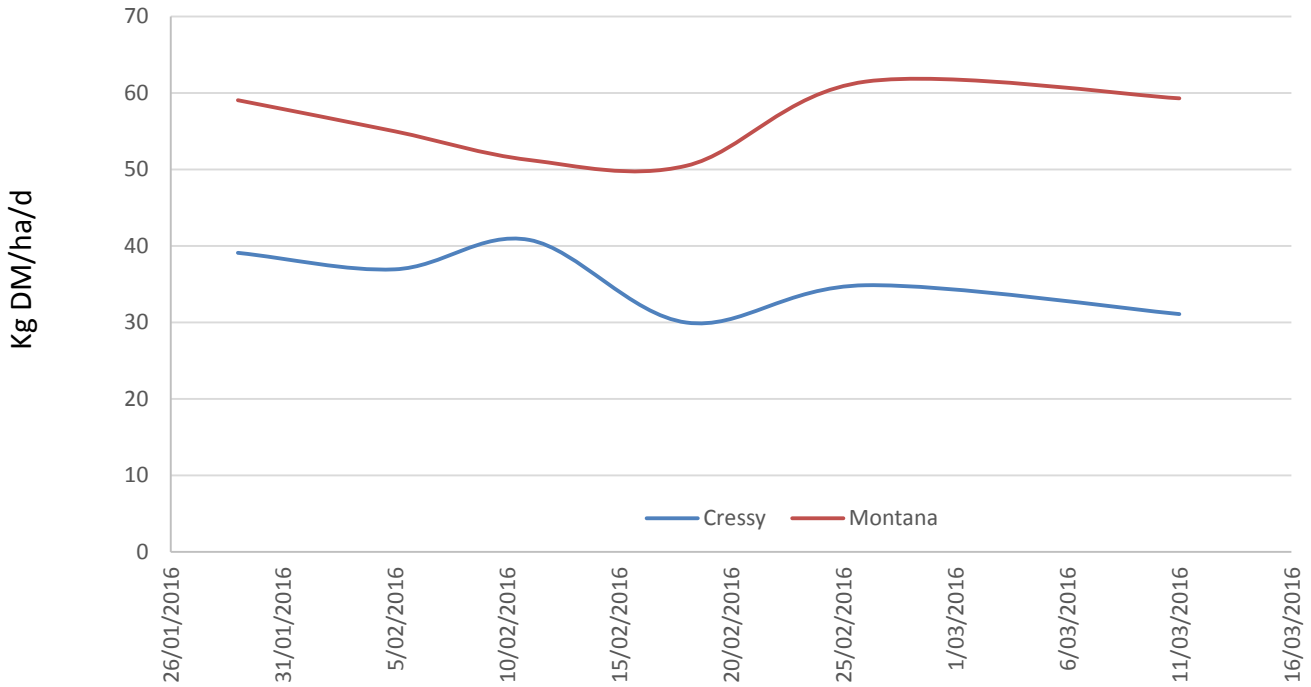
- Pump and motor replaced
- 787 kWh/ML vs
  206 kWh/ML
- Savings of $133/ML or
  $25000 for the season

Irrigation scheduling and Pasture productivity

Cressy – 6 ML/ha

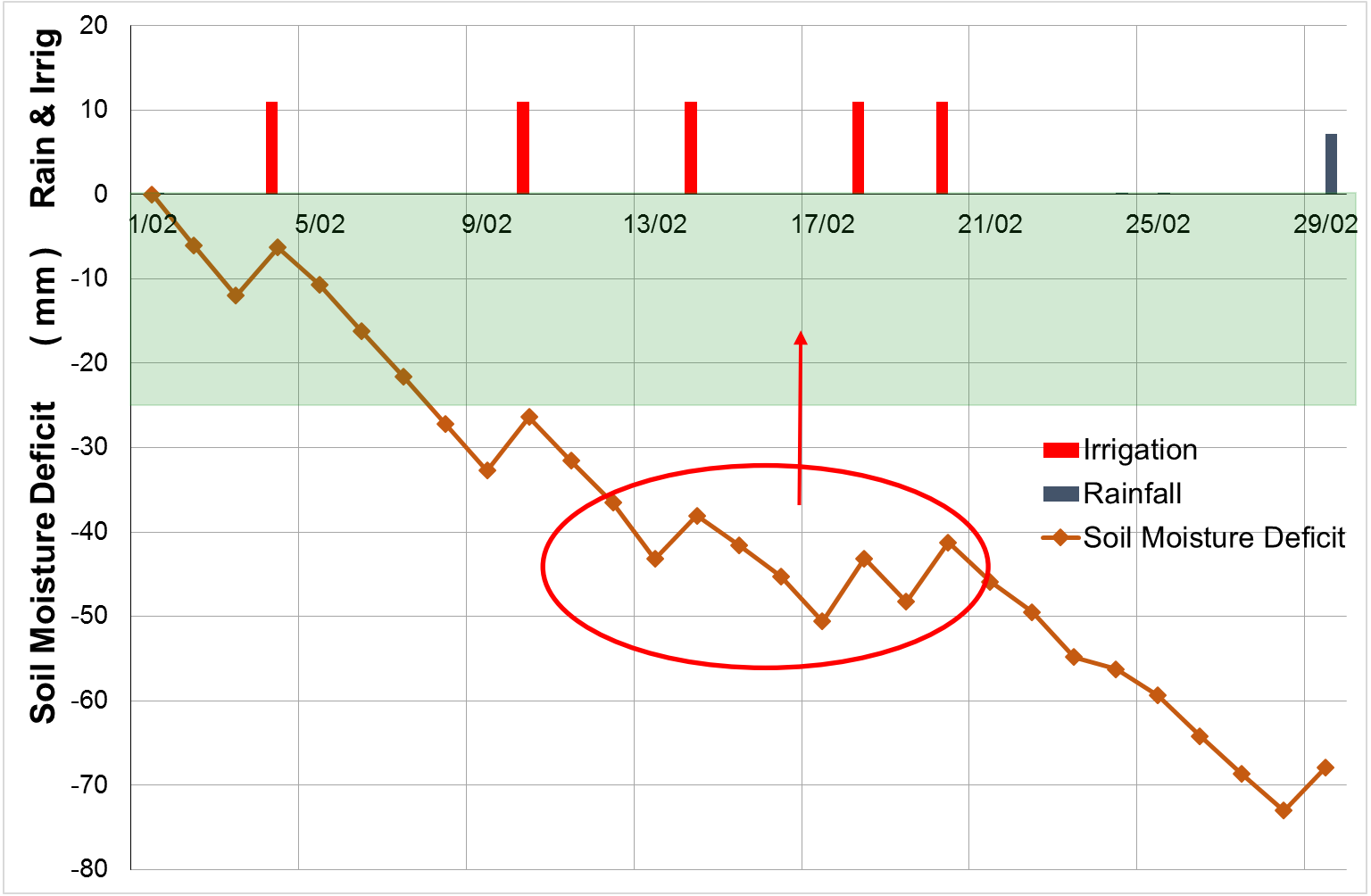
Montana – 4 ML/ha

Pasture growth rates



- Cressy averaged 30- 40kg DM/ha/d
- Opportunity loss of 20kg DM/ha/d
- Opportunity loss of 210t pasture on 117ha pivot replaced with purchased grain
- $200/t extra cost
- $42000 extra cost over three months

Cressy Pivot Water Balance



Automation

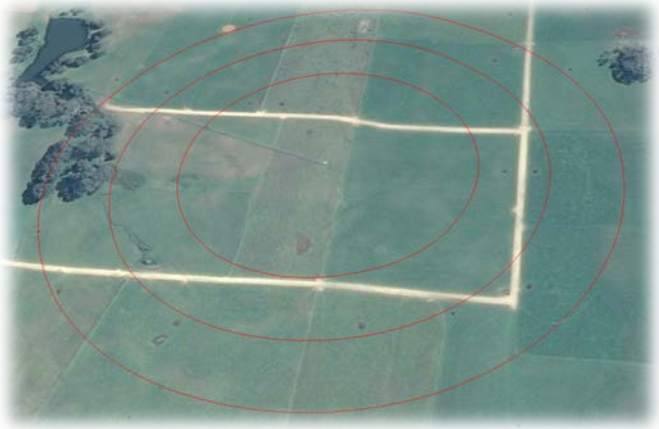
Cameras on TIA Dairy Research Farm

- Pasture height used for irrigation
- Height is measured using quad bike sensor
- Smartphone-based cameras on pivot upload image and location

Sample image

TIA Dairy Research Facility

Locations of cameras on pivot



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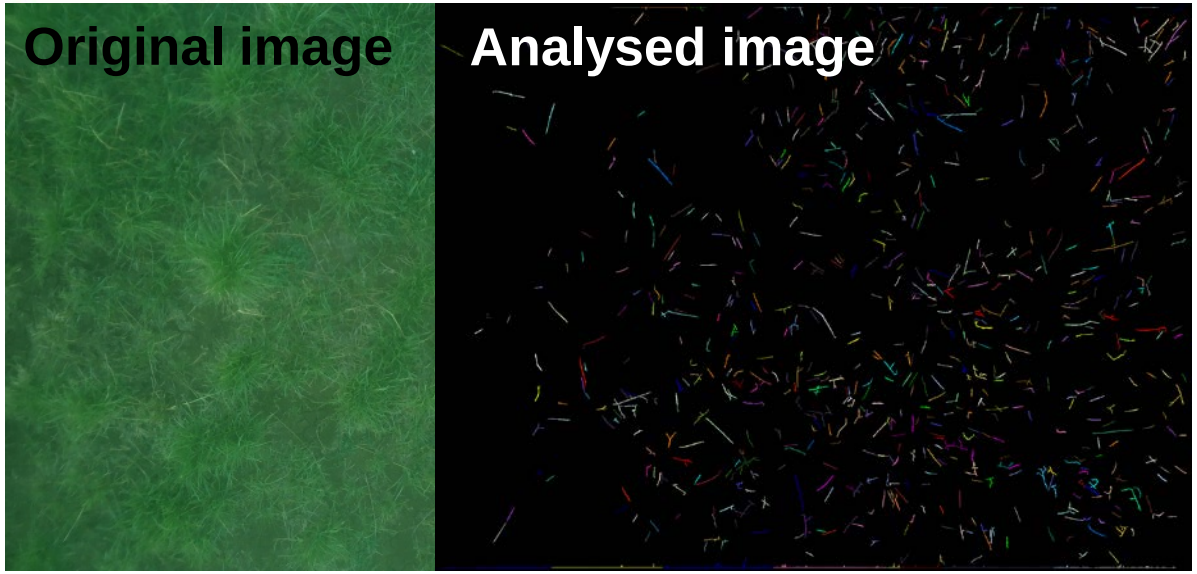
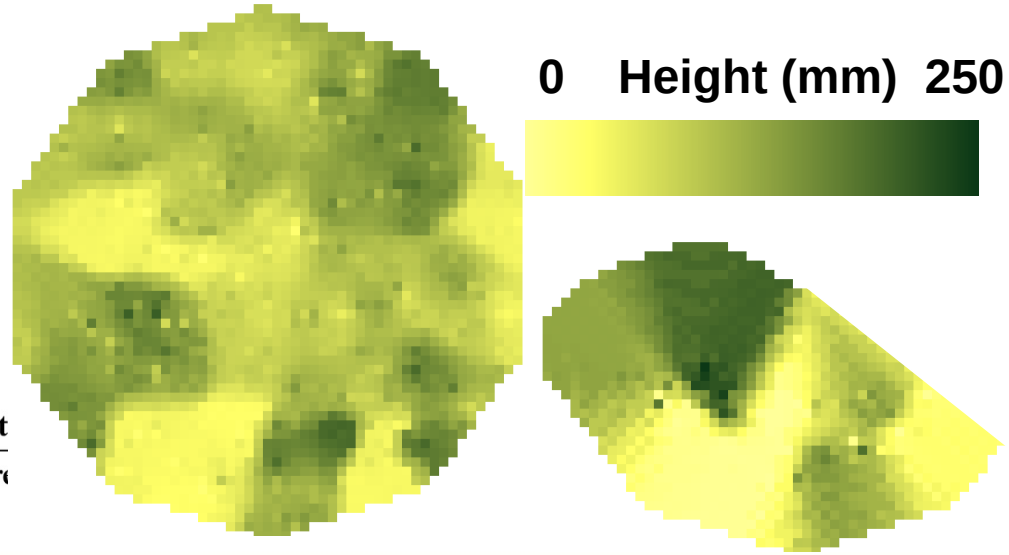
Automated irrigation for dairy pastures

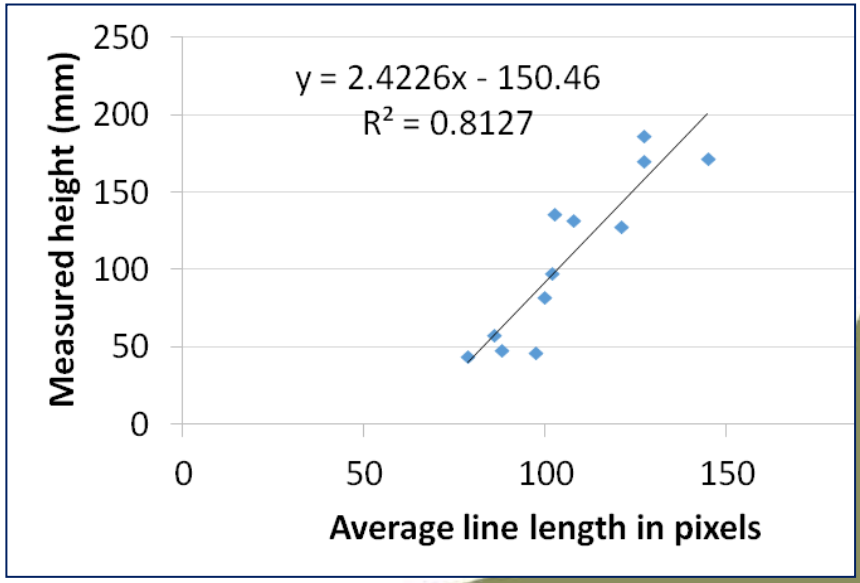
- Image analysis extracts average leaf length in camera image
- Compared with weekly quadbike height data



Height from quad bike sensor

Canopy cover from cameras





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Acknowledgements

David McLaren, TIA
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Five Farmers